

<b>Mission 9 Assignment</b>	<b>Name:</b>
<b>Pre-Mission Preparation</b>	
In previous missions, you used a list to hold multiple related values. What do you remember about lists:	<p>Answers will vary.</p> <ul style="list-style-type: none"> <li>• Lists are defined with [square brackets]</li> <li>• Lists can store more than one value</li> <li>• Items in a list are accessed by index</li> <li>• The first index in a list is 0</li> <li>• Item = my_list[index]</li> <li>• A list can be used to turn on LEDs</li> <li>• You can add an item to the end of a list with append()</li> </ul>
<b>Mission 9 Checks</b>	
Objective #1 What data type is used to turn on the line sensor LEDs?	A list of Booleans
Objective #2 List at least three things you can do in REPL:	<p>Answers will vary. Answers can include:</p> <ul style="list-style-type: none"> <li>• Output messages with print()</li> <li>• Input strings with input()</li> <li>• Use as a calculator</li> <li>• Test python functions and methods</li> <li>• Experiment with APIs</li> </ul>
Quiz: List comprehensions and Tuples The command ls.check() returns a tuple. Open the toolbox and learn more about tuples. How do you define a tuple? How do you index an item in a tuple?	<p>A tuple is a read-only list (it can't be changed)</p> <p>my_tuple = (0, 1, 2) – use parenthesis for tuple definition</p> <p>item = my_tuple[index] – same as a list</p>
Objective #3 What is the algorithm for the bang-bang controller:	<p>Algorithm:</p> <ul style="list-style-type: none"> <li>• If left sensor is hit, turn left</li> <li>• If right sensor is hit, turn right</li> <li>• Otherwise, go straight</li> </ul>
Objective #4 What code do you need to check if the CodeBot is on a line?	elif vals[1] or vals[2] or vals[3]:
Objective #5 prev_vals = None   What does None mean? (Click on the word to open the toolbox.)	None means “no value” – it is often used to initialize a variable prior to it being assigned a value with a data type.
What is the code to print only if vals has changed?	<pre>if vals != prev_vals:     print(vals)     Prev_vals = vals</pre>

Objective #6 What is the structure of a dictionary?	A dictionary consists of {key: value, } pairs, with a key that maps to a value. You can look up a value from a key, and a key from a value.
What code will lookup a value in a dictionary?	value = dict[key] err = ls_err[vals]
What happens if a key is not in the dictionary?	KeyError
Objective #7 What method is used to get a value while avoiding a KeyError?	get() err = ls_err.get(vals, err)
Objective #8 What does "PID" stand for?	Proportional, Integral, Derivative
When does an UnboundLocalError occur?	It occurs when a function tries to use a value of a variable that has never been assigned. – the
How do you eliminate the error?	Use the global keyword with the ariable
Objective #9 What constants did you need to modify to run the course?	Answers will vary – probably SPEED and TURN_FACTOR
<b>Post-Mission Reflection</b>	
Discuss a problem you had with the program. How did you overcome the problem?	Answers will vary
You learned a lot about line sensors during missions 7, 8 and 9. Think of a non-electronic device that would be really cool if it had some kind of line sensing. Describe how it would work:	Hopefully students will be really creative: <ul style="list-style-type: none"> <li>• Sports equipment, like a basketball so when you practice free throws you don't have to chase the ball</li> <li>• A pencil, so when you are writing you stay within the margins</li> <li>• etc.</li> </ul>